

# CURRENT LITERATURE

## BOOK REVIEWS

### Studies in fossil botany

SCOTT'S *Studies in fossil botany* has been the standard text in its field since 1900. It is not a text on paleobotany in the ordinary sense, but is restricted to the vascular plants, and in presenting them deals especially with their "morphological and evolutionary aspects." This means an expert culling of significant structures from the enormous mass of published paleobotanical material, and it has been of immense service to those morphologists who wish to use the historical background. During the present decade this kind of paleobotany has not only made notable advance in the precision of its methods, but it has made some very remarkable discoveries. The rapid progress in knowledge has compelled a second edition of SCOTT'S *Studies*,<sup>1</sup> which has grown from a book of 533 pages to one of 683 pages, the illustrations having increased from 151 to 213.

To note even all of the important changes would be impossible in a brief review, and this is not necessary for those morphologists who have followed the literature of the subject since 1900; but the assembling of the results recorded in scattered papers is very impressive. A few of the advances that should be borne in mind even by the general morphologist may be noted.

The primary divisions of pteridophytes are increased in number by the admission of NATHORST'S Pseudoborniales, discovered in the Upper Devonian of the arctic regions and described in 1902. These remarkable forms are known as yet only from impressions, but the stems are articulated, branching, probably creeping, bearing whorls of repeatedly dichotomous leaves with deeply pinnatifid leaflets and long loose strobili ("spikes") with whorled sporophylls resembling reduced foliage leaves.

The seedlike megasporangia of some of the paleozoic Lycopodiales, referred to briefly in the first edition, assume greater proportions in the second. The conclusion is becoming irresistible that no definition of a seed can be constructed which will exclude the megasporangiate structures of these ancient lycopods, and yet it is evident that they should not belong to the Spermatophyta. The definition of a great group can no longer be based upon a single character, but must be based upon a plexus of characters.

The presentation of paleozoic Filicales has been absolutely transformed. It is during the present decade that the "Pteridospermeae" have practically replaced the supposed paleozoic "ferns," and the present volume can claim only

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<sup>1</sup> SCOTT, DUKINFELD HENRY, *Studies in fossil botany*. Second edition. 8vo. pp. xxiv + 683. *figs.* 213. London: Adam and Charles Black. 1909. 10s 6d.

the Botryopterideae as sure representatives of paleozoic Filicales. It must always be remembered, however, that all the members of the great frond genera have not been proved to be seed plants, but they are all under suspicion.

Of course the "pteridosperms" are presented with a completeness that has not been possible heretofore. In traversing the evidence, SCOTT reaches the conclusion that every great frond genus is involved in the seed-bearing habit, and also in the discovery of stamens. It is of interest to note that the *Crossotheca* ("epaulet") type of stamens is probably the prevailing kind, and that the so-called *Calymmatotheca* ("cupule") type is likely to be the husk or cupule of seeds. The statement that *Gnetopsis elliptica*, which has been one of the guesses at a history for the Gnetales, is probably a seed of the Lyginodendreae relieves a very doubtful situation.

The perspective of the Cordaitales is increased by the recognition of *Poroxylon* and *Pityx* as intermediate in vascular structure between *Lyginodendron* and *Cordaitea*, the gradation from the mesarch cylinder of the former to the endarch cylinder of the latter being very complete. As a consequence, the group Cordaitales is made to comprise *Pityeae*, *Poroxlyeae*, and *Cordaiteae*.

The mesozoic Bennettitales represent the second great vascular group that has been brought to light during the last decade, and their presentation is another new feature of the volume. WIELAND'S laborious researches have developed a knowledge of this extinct and widely distributed cycadean group that almost rivals that of the living groups. SCOTT inclines to follow WIELAND'S suggestion that the remarkable strobilus of Bennettitales must be taken into consideration in searching for the origin of the angiosperms, a view that is certainly not contradicted at present by the history of the two groups.

Perhaps the most significant suggestion in the volume is a proposed new classification of vascular plants. SCOTT evidently feels that the old division into pteridophytes and spermatophytes has about outlived its usefulness, a feeling doubtless shared by all morphologists who deal specially with the two groups. Whether the exact form of the suggestion will be acceptable or not remains to be seen, but the author is to be congratulated upon being bold enough to break the silence again. His suggestion is that vascular plants be grouped in three primary assemblages: *Sphenopsida* (*Equisetales*, *Pseudoborniales*, *Sphenophyllales*, *Psilotales*), *Lycopsida* (*Lycopodiales*), and *Pteropsida* (*Filicales*, *Pteridospermeae*, *Gymnospermeae*, and *Angiospermeae*). This crosses the old division, and the author expresses the opinion that "the traditional classification will no doubt continue to be used on grounds of convenience;" in fact, the two volumes, in which the present work also appears, bear the subtitles "Pteridophyta" and "Spermophyta." *Pteropsida* and *Lycopsida* are names proposed by JEFFREY, who made a similar proposition years ago. The former name is used as JEFFREY defined it; but the latter is limited to the *Lycopodiales*, as the only "typically microphyllous phylum." SCOTT does not think that the "sporangiphoric pteridophytes" (BOWER'S name for SCOTT'S *Sphenopsida*) show an affinity for the lycopods that would justify their inclusion under a common name.—J. M. C.